DOCUMENT RESUME

ED 239 634 IR 050 600

TITLE	Library Theory and Research Section. Education and Research Division. Papers.
INSTITUTION	International Federation of Library Associations, The Hague (Netherlands).
PUB DATE	Aug 83
NOTE	81p.; Papers presented at the Annual Conference of the International Federation of Library Associations (49th, Munich, West Germany, August 21-27, 1983). For other papers presented at this conference, see IR 050 592-601.
PUB TYPE	Viewpoints (120) -- Reports - General (140) -- Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Arabic; *Computers; Developing Nations; Foreign Countries; *Information Science; *Information Services; *International Organizations; Library Associations; Library Circulation; *Library Research; Library Role; Linguistics; Models; Political Science; Records (Forms); Theories; Videotex
IDENTIFIERS	Caribbean; Latin America

ABSTRACT

Papers on library/information science theory and research, which were presented at the 1983 International Federation of Library Associations (IFLA) conference, include: (1) "The Role of the Library in Computer-Aided Information and Documentation Systems," in which Wolf D. Rauch (West Germany) asserts that libraries must adapt to the increasing use of computerized systems, for example by using videotex to provide referral and information services; (2) "Use of Arabic in Computerized Information Interchange," in which Mohammed M. Aman (United States) discusses current efforts to develop input/output devices, hardware, software, and a character code suitable for use with the Arabic language; (3) "Library and Information Science Research: The Case of Latin America and the Caribbean" by Esther R. Dyer and John Clark (United States), which outlines the availability of qualified researchers, access to scholarly resources, use of appropriate research techniques, and access to scholarly communication channels in these geographic areas; (4) "Guide-lines for the Lending of Library Documents: Loan Forms and Various Regulations Concerning Exhibitions," an analysis by M. T. Varlamoff of documents concerned with the lending of library materials for exhibitions (collected in 1983 from 28 libraries); (5) "Developing Theoretical Frameworks through the Use of Borrowed Models and Interdisciplinary Interpenetration," in which Margaret Anderson (Canada) discusses the development of theory in information science and political science and the possibilities of cooperative theory development between library/information science and linguistics. (ESR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED239634

INTERNATIONAL FEDERATION OF LIBRARY ASSOCIATIONS
General Conference, Munich, West Germany, August 21-27, 1983.
Library Theory and Research Section. Education and Research Division.
Papers.

IR050600

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

IFLA

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IFLA GENERAL CONFERENCE MUNICH 1983
Division of Education and Research
Section Library Theory and Research

61-EDU-1-E

The Role of the Library in Computer-Aided Information and Documentation Systems

By

Wolf D. Rauch
Gesellschaft für Information und Dokumentation
Sektion für Kommunikation
Postfach 71 03 70
D-6000 - Frankfurt/Main - 71
Federal Republic of Germany

For internal use only:
to be brought to meeting no:
104
Remarks: S1
to be presented orally ☒
for distribution only ☐

1) Technological World - Informationized World ?

Last year (1982) the New York magazine "Time" declared the Computer "Man of the Year", putting forward that this machine had exercised (for better or for worse) the greatest influence on the events of that year. This is only one example out of many which respond to the evergrowing penetration of computer-aided information and documentation systems into our individual life. The Club of Rome presented a report (1), and so did the French President of State (2).

The fact that information and documentation systems will revolutionize elementary social relations - such as the citizen's to his state, the workman's to his employer, the producer's to the consumer - is as such not new. Norbert Wiener (3), Fritz Machlup (4) and Marshall McLuhan (5) have pointed it out. Lately, however, its quality has changed, and so has the immediate affection of the individual. This is why the impact by computers makes us, and must make us, so very alert these days.

This new dimension was gained when smaller and cheaper computers could be produced and when on-line access to computers was introduced. Microprocessors, installed in numerous apparatusses and machines, took over "intelligent" functions. The application of computer-aided information and documentation systems in the office and in administration (as well as in any other field treating information in the widest sense) was begun. In highly industrialized societies up to 50 p.c. of all working people are estimated to be

directly involved in the treatment of information. Almost everybody is indirectly concerned (6).

The new quality of computer applications allows, for the first time in history, to replace or support not only manual work but also intellectual tasks by man-made tools. Such phrases as the "Industrialization of Intellectual Work", "Second Industrial Revolution", or "Informationization of Society" express that the application of computer-aided information and communication systems is being regarded in a larger social context, and that it is an innovation comparable to the industrialization in the 19th century with regard to the field of production of goods or to the introduction of printing or the invention of writing as to the history of culture.

"Informationization of Society" is being understood both as the big chance for a period of economic growth and as a danger of unemployment and loss of freedom to the individual. One characteristic of the discussion unfortunately is the lack of knowledge about future developments. One question in particular has not yet been answered: whether (and how) new media for communication and information evoke alterations of the transmitted contents. If they do so, they may eventually change our conception of reality.

At the same time, the impact of information and "intelligence" on machines and information systems is growing also in all activities and institutions working with information and knowledge, e.g. libraries. The motto of this conference

"Libraries in a Technological World" also implies that information systems have approached the very heart of traditional information storage and handling. Even though the technological age began over a 100 years ago - e.g. for transport and production - the libraries have so far been hardly concerned with "technisation". Only now new technology does hit the "nervus rerum". And again I regard the inevitability of the development as an indication that "Informationization of Society" is more than a chronocentrically overestimated peritorial phenomenon. Informationization does in fact show the described potential for a basical innovation.

2) Trends in development affected by the application of computer-aided information systems

Taking for granted that the "Informationization of Society" be something basically new, means that future developments will be so fundamental and so many-folded that predictions at the moment can hardly be made. Keeping this in mind, I shall nevertheless try to sketch a few probable movements which are also relevant for the library.

"Informationization" will be first applied on a wider scale in the offices: Here, the near future is often characterized as the "paperless office", synonymously used is "office of the future". From here it is only a small step to the "end of the book" - a development which would certainly be of some importance to the library. Since the production of paper is expensive and consumes large quantities of resources, the replacement of paper will be found a good option from economic

and ecological points of view (7). With the new computer-aided information and communication media such a development is - technically speaking - no longer impossible. On the other hand, judging from empiric observation, we do not yet know whether these developments will occur at all - in any case, definitely not very soon. Contrary, the waste of paper seems to have been exploding through computer-aided information and communication media (8). Besides, there are certain types of books such as school books, art books, fine literature books, the replacement of which are obviously not reasonable (9). Still, the dominating role paper plays now as the practically only solid vehicle of knowledge will certainly diminish: Offensive rivalry may be observed in particular with scientific periodicals, lexical works and the so called "grey" literature. Secondly, the printed book will lose - with all legal and economic consequences - its role as the primary source of reference. We must get used to the idea of a publication originally stored on an electronic medium, thus allowing any form, quantity and means of "copies" (some of them possibly on paper).

The development is being accelerated by computer networks. Through digital packet-switching networks even large quantities of information can be transferred - avoiding all manual transport. Digital packet-switching networks already offer quicker and cheaper transmission than conventional methods do (e.g. having books or photocopies sent by mail). This technique is already in its present form relevant to traditional institutions of scientific information and communication (e.g. book requests

through on-line access to computers or telefax). Publishers have responded to the development with first steps towards electronic publishing.

As a result, we might also face fundamental changes of traditional structures and forms of institutions in the information and documentation fields. Networks will increasingly allow documentary services as well as internal communications directly from one's own desk. The terminal on the desk will allow (at least theoretically) the realization of a good deal of information and documentation without even leaving one's working place. Various services, such as documentary information, on-line searching, personal communication, the use of registers or data-base-access may thus be unified and standardized, at the same time re-integrating technically the various sources of information for the user.

The new technical developments make it therefore necessary to reconsider the traditional ways of approaching knowledge. We are now being confronted with new technical options: in particular, differences between the media will deminish. In future a text must be equally produced as a book, micro-fiche, disk, tape or computer-printed version if users' demands shall be met.

Of course, this development involves new roles in the traditional relation between author - publisher - bookseller - librarian: Producers and distributors of computer technology, computing centres, photographic firms are, for example, new actors. A few PTT-authorities and a few publishers and documentation centres will be "traditional actors" offering new services. The future role of the library, however, is still uncertain.

3) The role of the library

In management theory there is the hypothesis that the survival of institutions mainly depends on the flexibility in reacting to altered external conditions; i.e. especially flexibility in defining one's own goals (10). Take the example of the railway: Some railway companies have held railtransport to be their main objective - not transport in general. Later on, railtransport lost its leading position and the railway companies faced big problems - e.g. in the West of the USA. In some countries railway companies perceived their main task to be in the transport business in general; before it was too late the railway-companies combined rail and road, hired busses, and have, due to seeing their task in such a wide sense, supported not only firms, but the railway as such. Analogies have appeared in many other fields of economy.

You will say that railways have only little in common with information or libraries. Still, if you cannot accept the above example as a suitable analogy, consider it to be a metaphor for the role of the library in computer-aided information and

communication systems.

The role of the library is certainly not limited to the storage and administration of books, nor is it true that all information and communication media concern the library. Neither individual communication (e.g. talks, letters) is part of the traditional library's job, nor all mass communication (e.g. lectures, mass-media). The libraries are not expected to take these over ; however, being neighbouring fields, they must not be neglected. The main library function, namely the storage and administration of information media for selected use by the patron, will stay the same in a technological world. This traditional service is described as "indirect selective communication". 'Indirect' means, the creator of information is not acting himself - 'selective', since the user makes the choice as to which information might be relevant to him. Indirect selective communication (so far the very heart of institutionalised information) will naturally lose importance while direct and dispersed communication through computer-aided information and communication systems will gain ground. Nevertheless, with a generally rising level of information and communication sensitivity there is a fair chance that the library will even gain importance in absolute terms over the years.

To sum it up, the challenge for the library is to maintain its primary goals in a changing information environment: the storage of knowledge and its transfer to coming generations - a function sometimes neglected by new media. The fading impor-

tance of books and the rising influence of new media suggest a reorganization of the library - taking into account all non-printed publications, too.

Secondly, the treatment and teaching of the specific knowledge and art of librarianship becomes important. It could helpfully facilitate computer-aided information and communication systems and avoid the repetition of old mistakes, which have led to the re-invention of traditional knowledge.

Beyond simple continuation under altered circumstances, libraries might also profit from computer-aided information and communication systems. Each of the well known helpful inventions in the office (like text systems, office computers, in-house-networks) might be useful for any library. There is also a series of new instruments to facilitate coordination and work-sharing between libraries, mainly by applying numerous information and communication networks. Since these nets have also been linked internationally, it would be easy for the libraries to be the main supplier of written knowledge for the entire globe on a larger scale than so far.

Taking library functions in a wide sense, they could easily combine traditional tasks and new technologies to achieve a hitherto unknown quality of library services. This may be realised when libraries apply computer-aided information and communication systems not only in order to solve their traditional problems and not only to serve their ordinary clients - but also to open the system as widely as possible: Public

access to teletex, telefax and data-networks, within a country or internationally, will more and more be necessary and attractive facilities for the user. Such services may also attract people who have so far not gone to libraries and additionally libraries could attain, in their respective locations, an indispensible position through public use of their equipment.

I have sketched here one possibility of a new role of the library in an "informationized society": forming the focal point of community activities in communication and culture. Equal rights of knowledge could be guaranteed in the "Informationized Society" by the library through access to knowledge equally to everybody - and this means increasingly: access to computer-aided information and communication systems. So there could be a new dimension of the social and cultural mission of the library in the prevention of social unbalancedness through informationization.

4) Take an example: Videotex

Having so far spoken in general terms only, I shall now explain the use of computer-aided information and computer systems in the library with the example of Videotex. Videotex is the connection of the telephone network, TV-screens, modems and decoders in a cheap computer-aided information and communication system for everybody. In many European countries Videotex is being experimented upon in field trials. Great Britain is even offering Videotex as a regular postal service, named Prestel.

At the first glance Videotex seems totally inapt for libraries: the bandwidth is too small for the transmission of larger quantities of information, and it is not a good reading medium, which is true for all screen systems. Videotex is nevertheless being tested in a whole series of projects and in the library sector, too.

One main asset of this new medium may be its use as a referral system: Whoever tries to solve a problem via Videotex will often be bound to consult other information sources: other books, other libraries, their catalogues etc. Searching these data could be vastly facilitated by a well functioning referral system via Videotex. We could for example imagine a network which makes orders possible from other libraries and/ or book shops. In this way books and libraries are not only referred to by Videotex, but their outstanding qualities as guides allowing further information are becomming a functional element within a new complex information system. It is the library that could combine the benefits of the book and of Videotex. A recent Austrian study goes even one step further by offering on Videotex additional literature relevant for TV programmes: This means that the book is being re-introduced after other media having replaced it (11).

Videotex has the chance to become - once publically introduced - a well known and well used information medium for a considerable part of the society. It could be interesting for libraries to take advantage of the new medium Videotex and to offer their catalogues on-line, allowing the private user to

read and interact with library data in a familiar way,possibly even at home. Also in this direction research is going on.

When it was first tried to install Videotex for the general public, they found out that at present no institution with public access was in a position to take over the described function as a service being organically integrated within the said institution (12). Post offices, railway stations, or banks have been in discussion and do partly occupy even now a more important place in the public debate than do libraries. This is just the more deplorable since post offices, railway stations, and banks are neither connected with other information media nor do they offer any related information services. This is once more why the libraries are being granted the chance to become through the new media "cultural market places" of the information society - a role which should not only please the library as such, but which would also bring back the book into a respectable position within computer-aided information and communication systems, so to say, in the "Information Society".

6) Literature

1) G. Friedrichs, A. Schaff (Hrsg.). Auf Gedeih und Verderb; Mikroelektronik und Gesellschaft, Bericht an den Club of Rome. Wien 1982.

2) S. Nora, A. Minc. L'informatisation de la société. Paris 1978.

3) N. Wiener. Kybernetik - Regelung und Nachrichtenübertragung in Lebewesen und Maschine. Hamburg 1968.

4) F. Machlup. The Production and Distribution of Knowledge in the United States. Princeton 1962.

5) M. McLuhan. The Gutenberg galaxy. Toronto 1962.

6) W. Rauch. Büro-Informations-Systeme. Wien 1982, S. 113 ff

7) H. Maurer, W. Rauch, I. Sebestyen. Some remarks on energy and resource consumption of new information technology. In: Information Services & Use 2 (1982), S. 73-80.

8) W. Rauch. Büro-Informations-Systeme. Wien 1982, S. 92 ff

9) W. Rauch. WTI-Delphi. Österreichische Akademie der Wissenschaften. Wien 1978

10) A. Low. Zen and Creative Management. Garden City, New York 1976.

11) Ludwig Boltzmann Forschungsstelle für Informationstechnologische Systemforschung. IVS-Modell Österreich.

12) G. Greiner, H.A. Maurer. Der Bildschirmtext-Pilotversuch in Österreich verläuft erfolgreich. Institut für Informationsverarbeitung Graz, Bd. 16. Graz 1982.

IFLA 1983

IFLA GENERAL CONFERENCE MUNICH 1983

Division: Education and Research

Section: Library Theory and Research

111-THEOR-2-E

Use of Arabic in Computerized Information Interchange

By

Dr. Mohammed M. Aman
Dean and Professor
School of Library and Information Science
University of Wisconsin, Milwaukee
Milwaukee, Wisconsin
U.S.A.

For internal use only:
to be brought to meeting no:
. . . . . 177 . . . . .
Remarks:
to be presented orally [x]
for distribution only [ ]

Introduction

The Arabic language is spoken by over one hundred million people in twenty one countries throughout the world. The Arabic alphabet, which is also used in the Farsi and Urdu languages, is completely different from the Latin alphabet used in Western countries. This means that most of the relatively inexpensive computer equipment widely available in the West is unsuitable for the Arab market. Librarians who attempt to use Latin alphabet computers quickly become frustrated by the need to transliterate Arabic bibliographic information using Latin characters.

Instead of using Arabic terminals and input-output programs, the Library of Congress has decided to use the existing equipment and programs by transliterating information in its Middle East Catalog using the Latin alphabet. Arab member countries in the International Information System for Agricultural Sciences and Technology (AGRIS), whose carrier language is English, also face some difficulties in preparing documents written in the Arabic language for AGRIS input[1]. The method of script conversion through transliteration is foreign to Arab users who are the ultimate consumers of Arabic documents. Furthermore, there are several different and often inconsistent conversion systems, and their application leads inevitability to great diversity of practices and ensuing incompatibility of entries[2].

Arab operators in Arab libraries and information centers, using Latin terminals are not expected to be efficient in using Latin characters. Furthermore, because of the nature of Arabic names and the construction of Arabic bibliographic records, the use of the Latin alphabet will result in unavoidable errors.

The purpose of this paper is to identify problems associated with the use of Arabic in input and output (I/O) devices, the present efforts to introduce a unified code for the Arabic language along the ASCII and EBCDIC Codes, and to describe efforts being made to use Arabic in computerized information systems.

Technical and Linguistic Problems

The production of high quality Arabic/Latin terminals and printers poses technical problems that are peculiar to the Arabic language. These problems which should be addressed by linguists and computer scientists can be described as following:

1. Arabic is written from right to left and most letters in the Arabic word are joined together. Arabic numbers are also written from right to left. However, the most significant digit is found on the left so they do not appear reversed.
2. The Arabic alphabet consists of 31 characters (28 actually, plus the Hamza ء, Ta Marbutah ة, and Alif Maqsurah ى). Twenty-two of these letters can be joined on both sides and in the process take different shapes depending on their context in a word. The position can be in the beginning of the word, like بـ , or in

the middle of the word, like بب , or at the end of the word, like ببب . The letter can also be written separately not connected to another letter in the same word, like ب , as in باب. The final letter ب will cause a space within a word. Table 1 shows the Arabic letters, their names and pronounciation and Table 2 shows the multiplicity of forms and shapes of some of these characters.

3. The Arabic script is highly calligraphic. When Arabic printing was introduced early in the eighteenth century, the shapes of Arabic letters were an imitation of handwriting which was calligraphic. Thus, at first, printing was an imitation of calligraphy, even if a little simplified. As literacy spread, the opposite became true; writing became a simplification of typing.[3] This process continued, and still continues. Because of the still-powerful traditions of calligraphy, the users of the Arabic language tend to resist attempts to compromise aesthetics and quality of print for the sake of mechanical efficiency.

4. Besides the alphabet character set there are at least five vowels. These are optional in writing, used only when it is not possible to guess the exact word from the context. They are used in conjunction with other letters printed above or below the letter.

While the first problem is not serious, the second and third are. Vocalization symbols are essential for the semantics of Arabic sentences and words. These symbols are not customary in commercial type applications. In more complex applications in the field of information storage, search and retrieval, artificial intelligence, and language theory it is impossible to ignore them.

Thus, while the letters of the Latin alphabet have only one form, the sole exception being the use of capitals, this is not the case with Arabic script. Some characters appear in four, or possibly more, different shapes. Two characters (Alif and Lam) have special shapes whenever the Alif follows the Lam. There can be up to 900 letter shapes printed in calligraphic style. Currently, a well written Arabic book will have about 450 shapes, a fairly good quality newspaper will have 150, a typewriter 65 to 75, while a telex machine will have 52 characters[4].

TABLE 1

(a) Arabic Letters, Their Names and Pronounciation

1	ء	hamza:	glottal stop	17	ض	dad:	
2	ا	alif:	a	18	ط	ta':	emphatic T
3	ب	ba':	b	19	ظ	dha':	
4	ت	ta':	t	20	ع	'ayn:	
5	ة	ta'maqsurah:	t or h	21	غ	ghayn:	French Pronunciation of r
6	ث	tha':	th as in thin	22	ف	fa':	f
7	ج	jim:	j as in joke	23	ق	qaf:	uvular k
8	ح	ha':	Spanish pronounciation of ha	24	ك	kaf:	k
9	خ	kha':	German pronounciation of ch	25	ل	lam:	l
10	د	dal:	d	26	م	mim:	m
11	ذ	thal:	th as in this	27	ن	nun:	n
12	ر	ra':	r	28	ه	ha':	h
13	ز	za':	z	29	و	waw:	w
14	س	sin:	s	30	ي	ya':	y
15	ش	shin:	sh	31	ى	alif-maqsura:	a
16	ص	sad:	emphatic s				

(b) Vowel Points

32	ـَ	fathah:	(a)
33	ـُ	dammah:	(u)
34	ـِ	kasrah:	(i)
35	ـّ	shaddah:	(doubling)
36	ـْ	sukun:	(stop)

TABLE 2

Multiplicity of Shapes of Characters

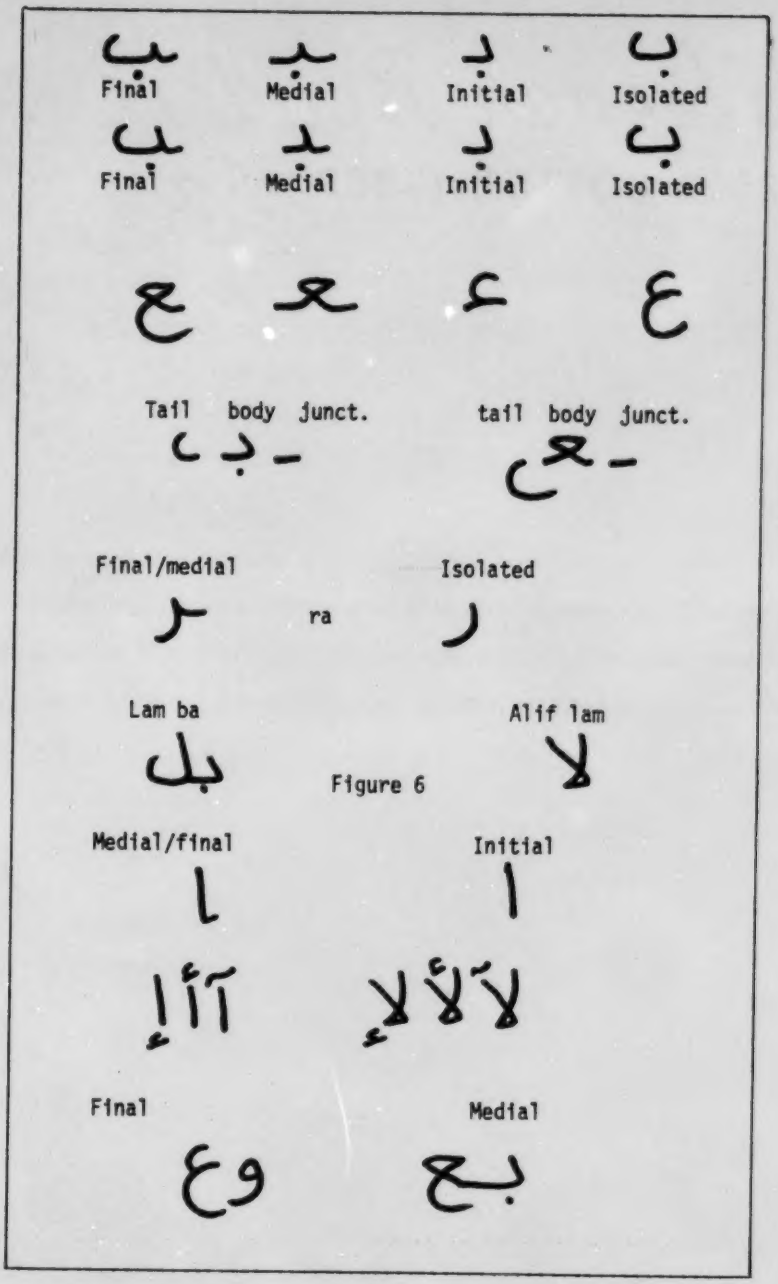

Figure 6

Arabic/Latin I/O Devices:

Over the last two years, an increasing number of sophisticated users have begun to rely upon computers on a large scale in text processsing and in small businesses; thus emphasizing the need for better bilingual terminals.

Recently it has become apparent that standardization of Arabic characters and their coding inside the computer is urgently needed to ensure compatibilty of products produced by various manufacturers.

Most existing I/O units suffer from one or more of the following shortcomings[5]:

1. Internal representation of Arabic code is not in any logical sequence.
2. No vocalization symbols are represented.
3. Character shapes are poorly represented and not pleasing to the reader's eye.
4. Keyboard and keyboard layout are not acceptable and are poorly designed.
5. Capabilities of the units are very limited.

Towards a Unified Arab Code

Between the years 1976-82, computer experts from the Arab world convened a series of meetings in an attempt to develop a unified code for the use of Arabic characters in infomatics. The most significant of the meetings were:

*June, 1976: IBI (Intergovernmental Bureau for Infomatics) - the first step towards open discussion concerning the standardization of the use of Arabic in data processing; also led to the formation of COARIN (Committee on Arabic in Infomatics).[6]

*April, 1977: ALECSO (Arab League Educational, Cultural and Scientific Organization) - an agreement was reached on the adoption of a

unified Arabic code and on the number of Arab characters to be represented, as well as the diacritics needed to produce an acceptable Arabic text.(7)

*June 1977: COARIN - approved the joint Iraqi-Moroccan proposal for a unified Arabic code for infomatics known as CODAR-U, which consisted of a 31 Arabic character set and several optional sets that take care of the vocalization symbols.(8) (see Table 3)

*June 1980: SASO (Saudi Arabian Standards Organization) - accepted CODAR-U as a starting point toward a unified Arabic code

*September 1980: ALECSO - a modified and improved version of CODAR-U.(9)

*April 1982: ALECSO - an agreement was reached to accept the modified version of CODAR-U known as CODAR-U/FD (Unified Arab Code - Final Version).(10) (see Table 4)

The importance of using CODAR-U/FD is due to the fact that several Arab countries have worked together for seven years to develop the appropriate set of Arabic characters that can be used in the computer field throughout the Arab world.

The Hydriyya Method

This method, introduced by Professor Hyder at the Department of Computer Science, University of Montreal, Canada, requires that when a key is pressed, the letter is not printed immediately but is stored in the terminal's buffer. When the next character or space is typed, the

TABLE 3

CODAR-U

b_8	b_7	b_6	b_5		0	1	2	3	4	5	6	7
					0	0	0	0	1	1	1	1
					0	0	1	1	0	0	1	1
					0	1	0	1	0	1	0	1
0	0	0	0	0	NUL	TC_7	SP	0	@	ـٰ	ب	ظ
0	0	0	1	1	TC_1 (SOH)	DC_1	!	1	ـً	٠	ت	ع
0	0	1	0	2	TC_2 (STX)	DC_2	"	2	ـً	ـّ	ة	غ
0	0	1	1	3	TC_3 (ETX)	DC_3	#	3	ـُ	ّ	ث	ف
0	1	0	0	4	TC_4 (EOT)	DC_4	¤ [2]	4	ـُ	أ	ج	ق
0	1	0	1	5	TC_5 (ENQ)	TC_8 (NAK)	%	5	ـّ	آ	ح	ك
0	1	1	0	6	TC_6 (ACK)	TC_9 (SYN)	&	6	ـّ	ؤ	خ	ل
0	1	1	1	7	BEL	TC_{10} (ETB)	'	7	ـَ	ئ	د	م
1	0	0	0	8	FE_0 (BS)	CAN	(	8	ـَ	ئ	ذ	ن
1	0	0	1	9	FE_1 (HT)	EM	)	9	ـٌ	إ	ر	ه
1	0	1	0	10	FE_2 [1] (LF)	SUB	*	:	ـُ	ي	ز	و
1	0	1	1	11	FE_3 [1] (VT)	ESC	+	؛	ـُ	پ	س	ة
1	1	0	0	12	FE_4 [1] (FF)	IS_4 (FS)	،	<	"	ڤ	ش	ا
1	1	0	1	13	FE_5 [1] (CR)	IS_3 (GS)	-	=	ـِ	گ	ص	ى
1	1	1	0	14	SO	IS_2 (RS)	.	>	ـِ	ع	ض	ۓ [3]
1	1	1	1	15	SI	IS_1 (US)	/	؟	ـِ	ا	ط	DEL

TABLE 4

CODAR-U/FD

b_4	b_3	b_2	b_1		0	1	2	3	4	5	6	7
				b_1	0	0	0	0	1	1	1	1
				b_2	0	0	1	1	0	0	1	1
				b_3	0	1	0	1	0	1	0	1
0	0	0	0	0			SP	O	﴿	ذ		ـّـ
0	0	0	1	1			!	1	ء	ر	ف	ـّـ
0	0	1	0	2			"	2	آ	ز	ق	ـّـ
0	0	1	1	3			#	3	أ	س	ك	
0	1	0	0	4			¤	4	ؤ	ش	ل	
0	1	0	1	5			%	5	إ	ص	م	
0	1	1	0	6			&	6	ئ	ض	ن	
0	1	1	1	7			'	7	ا	ط	ه	÷
1	0	0	0	8			)	8	ب	ظ	و	×
1	0	0	1	9			(	9	ة	ع	ي	«
1	0	1	0	10			*	:	ت	غ	ى	»
1	0	1	1	11			+	؛	ث	]	ـّـ	}
1	1	0	0	12			،	>	ج	\	ـّـ	|
1	1	0	1	13			-	=	ح	[	ـّـ	{
1	1	1	0	14			.	<	خ	^	ـّـ	_
1	1	1	1	15			/	؟	د	_	ـّـ	

terminal is then in a position to calculate both the correct shape of the first letter and the other code(s) needed to perform it. The second letter of the word is displayed when the third letter is keyed, and so the process is continued until the word is completed.

Under this method the terminal keyboard includes only the isolated Arabic character set. The proper shape of the character is selected automatically via the Arabic Script Processor (ASP) contained in the operating firmware. ASP will select the shape for every indvidual character according to its preceding and following characters[11].

To print/display the last letter in a word, the terminal checks the type of the preceding letter to decide whether the end letter is to be joined or if it is to be separate. The major advantage of this approach is that one key and code can be allocated for each letter of the alphabet, irrespective of its shape.[12]

Requirements for Arabic Terminals Suitable for Library Use:

Although a number of different manufacturers produce Arabic/Latin terminals and printers, none so far, has produced what could be termed a general purpose Arabic terminal with a standardized character set.

With the introduction of CODAR-U/FD, it will make more sense for manufacturers of Arab/Latin terminals to use one of the following two methods which are possible for representing the combined Arabic/Latin character sets:

(a) 7-bit CODAR-U/FD (Arabic) and 7-bit ASCII (Latin), with an appropriate escape sequence to switch between character sets and modes of operation (right-to-left and left-to-right)

(b) 8-bit combined Arabic-Latin (extension of ISO specifications 2022, 2375, and 646.

The hardware eventually chosen by Arab information specialists should also allow for:

(a) Full upper and lower case Latin plus CODAR-U/FD

(b) Microprogrammed elaboration of the form of the Arabic characters according to context, with the automatic display of the appropriate shapes of character endings. This will permit the storage of a unique code per character within the computer while allowing for correct display to the user.

(c) Mixed Arabic/Latin characters anywhere in the Arabic mode.

(d) Character matrix of sufficient resolution to permit easy recognition of individual characters.

It is advisable for Arab information specialists to determine precisely their requirements in their field and to work with their national computer centers which are actively working on these problems. A case in point is the Centre National de l'Informatique in Tunis which is working on a "definitive" terminal for handling Arabic text, under a grant from IBI. The Canadian IDRC is also looking into this problem in the context of the modifications needed for MINISIS, and will be using

the HP terminal as the basis for the development work to be done. In cooperation with IDRC, the Arab League Documentation Center is presently Arabizing the MINISIS I/O Programs using its Arabic terminals and will be able to use their combined experiences in selecting the definitive Arabic terminals to be used in ALDOC and elsewhere in the Arab world.

Among the manufacturers of bilingual terminals are[13]:

al-Muhandis. This Saudi company introduced its first terminal, the Ascribe, in 1980; its second, Al-Arabi has recently been released.

Ascribe displays the full ASCII Latin 96 character set and 112 Arabic character forms. It conforms with the SASO recommendations for the Arabic character set.

Alteration of Arabic characters to their correct start, medial or terminal forms is determined and handled by the terminal. Latin and Arabic can be mixed in the same line, the screen displaying both and without the field being altered. Mode change is handled by control keys.

All aspects of the Arabic/Latin features are controlled by the terminal through a Z80 micro-processor; no special software is required on the host computer.

Ascribe was developed by the al-Mudandis in conjunction with an affiliate, International Computer Systems, London and is manufctured in the UK by TDS.

Al-Arabi is based upon the TDV 2230, manufactured by the Norwegian Company Tandberg. Arabic features have been added to this terminal. The terminal, which is compatible with the DEC VT100 terminal is now being used throughout the Saudi Arabian National Bank's online system.

Scripto-Print, a full bi-lingual letter quality printer provides output for the Ascribe, while a new version is being introduced for al-Arabi.

Arabic Latin Information Systems (ALIS)

ALIS develops systems and terminals based on the Arabic terminal design of Dr. Hyder. The company has developed bi-lingual dot matrix printers and computer terminals. Its products include:

*Video terminals based on the ADDS Regent 40; the 1311 simultaneously displaying Arabic and Latin, the 1211, handling both languages but not simultaneously.

*Letter quality printer based on the Qume Sprint 5. Printing at 55 characters per second the 3260 SD handles either Latin or Arabic through interchangeable daisywheel print heads. Support software is on diskette.

Multi-Media Video (MMV)

MMV has produced Arabdata 20, which employs the ASCII Code for Arabic characters using one ASCII Code for each character. It displays English and Arabic simultaneously and performs contextual analysis to determine correct Arabic character shapes. Hard copy output is provided by the Arabprint 160, a dot matrix printer functioniong at 160 characters per second.

The Company has developed Arabic versions of the business application software running on the CADO microcomputer and created a bi-lingual version of the Apple II microcomputer. Called Arapple, the system

performs in either Arabic or English, carrying out automatic contextual analysis of Arabic characters.

EURAB

EURAB is an Arabic and Latin Computer terminal patented by ESA (European Space Agency)[14]. This multiple alphabet terminal allows for:

* Writing in Arabic with vowels explicitly displayed
* The simultaneous display of two pages of 800 characters each and a different alphabet per page
* Up to eight pages stored in the terminal buffer memory
* Independent printing of any number of stored pages while work is in progress at the keyboard.

The LEXAR software transforms the EURAB bilingual terminal into a data entry terminal.

They both form an integral part of the ESA-RECON interactive information retrieval system operated by the ESA Information Retrieval Service.

SK Computer Systems

A UK Digital Equipment systems house, SK Computers supply the text controller bi-lingual terminals and printer with DEC systems. SK

Computers has made two bi-lingual installations in Iraq. A range of bi-lingual software is being developed in conjunction with TTI Computer Systems, a software house experienced in creating Arabic systems.

IBM

IBM has introduced bi-lingual terminals that are not acceptable to the ARab experts. It has recently entered into an agreement with the Kuwait Institute for Scientific Research to work on problems associated with the use of Arabic in EDP.

ATARI

A recent agreement between al-Alamiya Company in Kuwait and the ATARI Corporation would result in the Arabization of the ATARI Home Computers. The project, when completed, would result in implementing Arabic on various Atari system components.

Saudi Computer Industries

A recent announcement in Saudi newspapers revealed that a group of Saudi professionals intend to market a "homegrown bilingual Arabic computer" to educational institutions that will make computer programming possible for non-English speaking Arabs. The Arab computer, known as al-Farabi, was developed by Saudi scientist Dr. Reda Seraj Al-Thiga, Dean of the Graduate School at the University of Petroleum and Minerals. A

group of Saudi professionals and scientists have formed Saudi Computer Industries to build the machine and launch Saudi Arabia's first indigenous computer company. The Arabic computer has built into it the ASCII code. The program can be adapted to any known Arabic code within a short period of time[15].

Unlike IBM and NEC computers, which translate English into Arabic and are bilingual, the Arabic computer is programmed in Arabic.

Arabization of Software

Related to the desire of Arab librarians to utilize Arabic/Latin terminals and VDU is their desire to Arabize library specific software. Changes in existing software concern support for the Arabic character set. These requirements include:

(a) The ability to support both Arabic and Latin character records within one data base.

(b) The ability to identify fields as being associated with a default character set for prompting and for the data contents which would require additional option in the data definition.

(d) The possibility of embedding character strings of one character set within a field containing text in a second set.

(e) Support for the generation of Arabic keys, including appropriate strippings, key extraction, and key generation options.

(f) The ability to display or print mixed Arabic/Latin text anywhere on a line or page, within the limitations of the software print formatting routines.

The Arab League Documentation Center in Tunis in cooperation with IDRC and with funding from the UNDP, has begun work on Arabizing the MINISIS Software by Arabizing MINISIS dialogue and messages, and translating its documentation. This is the first attempt in the Arab World to Arabize a software that could be used in Arab libraries and informationcenters. Being aware of the value of multilingual MINISIS, the Canadian IDRC has already begun the work of supporting alternate character sets within MINISIS.

This support will be done at the intrinsic level within MINISIS, with all input/output operations passing through a new intrinsic dedi- cated to handling character set problems. IDRC will be using the HP-2645A terminal with option L98 as the basis for this work, but will write the software in such a way as to make it as independent of the terminal as possible; a configuration processor will allow the user to specify certain characteristics of the terminal in use(16).

Related to the problem of Arabization of hardware and software are problems resulting from the lack of standardization and the tools needed to promote the use of unified standards within Arab library and information centers. Both ALDOC and ALECSO are attempting to promote the use of

unified Arabic standards for the bibliographic description of Arabic records.

Conclusion:

In search of a standardized approach to the use of Arabic in computerized information interchange, several possible solutions have been put forward for consideration by a number of Arab organizations and institutions. Although the software and hardware which have been proposed do not answer all the problems posed by the Arabic langauge and culture, there has been a great deal of progress made within the past four to five years. I believe we can expect an important breakthrough in this field in a very short time.

References

1. Hegazi, Osman and Ibrahim Zaki Ibrahim. A Case Study: Transliteration of Arabic characters in AGRIS, presented at the First International Information Conference, Cairo, Egypt. Dec. 13-15, 1982.

2. Wellisch, Hans H. "Script Conversion Practice in the World's Libraries", International Library Review v. 8 (1976) p. 55

3. Kubba, Ghassan A. "The Impact of Computers on Arabic Writing, Chacter Processing and Teaching," in Information Processing 80: Proceedings of IFIP Congress 80. Amsterdam: North Holland, 1980. p. 962.

4. Mosawi, Ali. "Bilingual Problems", Middle East Computing, (September 1982), p. 28

5. Dewachi, Abdullah. Considerations for the Implementation of an Arabic Code. Presented at the Conference of the Gulf Organization for Industrial Engineering, Doha, May 1981

6. "Isti'mal al-Shafra al-'Arabiya al-Muwahadd fil-Hasibat al-Iliktruniya," al-Mijallah al-'Arabiyah lil-'Ulum v. 1, no. 1, (November 1982) p. 95.

7. ALECSO, Final Report on the Use of the Arabic Language in Computers, Cairo, Ain Shams University, April 13-16, 1977.

8. IBI/COARIN, Minutes of the First Meeting, Rome, June 14-15, 1977.

9. al-Mijallah al-'Arabiyah lil-'Ulum, Op. Cit.

10. Ibid., p. 99

11. Mosawi, Ali, Op. Cit.

12. Ibid.

13. Ibid.

14. Isotta, N.E.C. "The EURAB Terminal," ESA Bulletin, no. 16 (October 1978), pp. 46-50

15. Graham, Doug. "Saudi-Built Computer Programs in Arabic," Saudi Business, (April 9-15, 1983), pp. 22-25.

16. Valentin, Robert. Computer Configuration and Applications for ALDOC. Paris: UNESCO, 1981. p. 35

IFLA
1933

147-THEOR-3-E

LIBRARY AND INFORMATION SCIENCE RESEARCH:

THE CASE OF LATIN AMERICA AND THE CARIBBEAN

by Dr. Esther R. Dyer

Blue Cross Blue Shield
of Greater New York

and John Clark

Rutgers University

A Paper prepared for an Open Meeting of the Standing Committee on theory and Research, Division of Education and Research, IFLA Conference, Munich, Germany August 1983

For internal use only:
to be brought to meeting no:
. . . . 127 . . . . . .
Remarks:
to be presented orally ☒
for distribution only ☐

To outline the structure, development and organization of library research in Latin America is no easy task. The state of the research art in that geographic area can be characterized as diffuse, uncoordinated and often even elusive. Coverage in scholarly journals is often eratic and frequently more duplicative than that of more developed areas. Both developed and developing countries, however, need to improve the quality and quantity of scholarly publications as well as enhance the organized and invisible networks that facilitate exchange of research information.

Generally speaking, library research in most geographic areas can be described as too little being done by too few and often without due consideration of previous contributions to the field. Unlike many scientific communities, the library research community does not adequately build upon, replicate or successfully adapt studies, does not fully question findings and often produces research lacking in scientific rigor, especially those which depend heavily on quantitative analysis. There is frequently a paucity of new ideas and a striking lack of theoretical investigation. These character faults, so to speak of library research in general, are even more pronounced in a region like Latin America that is developing and thus in many ways dependent upon outside sources for information and tecnnological transfer and that includes bibliographic control of research information. Latin America and the Caribbean encompasses a diversity of developing countries, at a variety of stages in developing information systems, publishing and library information science education as well as

the infrastructure for technological and scientific research and information control.

In general, library research seeks to investigate various theories, methods or current practices in a multiplicity of facets of librarianship, documentation and archival disciplines in such as way as to make the theory more reliable and accepted and the practice more efficient, more responsive to user needs and better evaluated. Characteristic of all professions is the concept that research is the cornerstone of the profession, a springboard for future development and enlightment.

However, the proper performance or even the adequate assessment of research necessitates several key ingredients:

1. researchers with analytical and quantitative ability
2. access to adequate scholarly resources in a timely fashion
3. use of appropriate research techniques and adequate analysis of findings
4. communications of results through scholarly channels of communications, such as journals, or participation in seminars or conferences.

"A fundamental obstacle to the development of research [in developing countries] is the lack of... infrastructure, lack of qualified staff, lack of administrative support and lack of support services" (7). This paper therefore addresses the status of each of the four research ingredients in the context of the national realities of countries in Latin America and the Caribbean.

Many Latin American scholars (2-6, 7, 10) have addressed themselves to the critical shortage of adequately trained researchers in the region. There is a definite lack of a critical mass of qualified researchers, a cadre of individuals with quantitative and analytical ability. Figueiredo observed that in Brazil, there are only a few scholars with the PhD and this is typical of most of the region (5). An observer of regional library research and training for research stated that:

> due to archaic and traditional structures, rigid curricula, lack of teachers in the academic careers, deficient education of teachers in the methodology of research and the isolation of the schools from the national reality, research is almost non-existent (4).

Teaching and research are uneasy partners in Latin America. At a number of seminars and conferences (2,5,12) for many years, suggestions have been made to upgrade the research capability of teachers in library and information science schools. At one such conference (2) a recommendation was made that every country in the region should study the human resource needs for library and information science services, including the current and projected qualifications of researchers. A further recommendation addressed the need to include in national systems of information training of researchers. The primary question is, however, who will train the trainers. Roberto Juarroz cites the general

problem of education abroad - and this is where most of the PhD's have been trained - and that is the more or less mechanical transfer of models from developed countries and lack of adaptation to the national realities of Latin America.

A Brazilian study found that research projects had a low priority and lacked continuity or pre-planning (6) and recommended that universities and related government agencies seek to find ways to motivate researchers and facilitate the research process.

Studies have shown that much of the research in our field is generated in the academic community by professors embroiled in the publish or perish syndrome. In the U.S., however, universities recognize that in order to do research, some accommodation must be given to professors. Typically, therefore, those professors teaching at the graduate level and thus assumedly more involved in research carry a lesser load of teaching hours; while their colleagues involved in undergraduate programs spend more time teaching and are expected to produce less research. There is provision for a sabbatical and often incentive to seek outside grants and research funds as well as leaves of absence. Such is not the case in Latin America or the Caribbean. Many university teachers are overburdened with heavy course-loads and further hampered by their own inadequate statistical preparation. Recommendations of a meeting of library school directors (Bogotá 1977) specifically stated that schools should restructure their program to provide time

for research and to make concerted efforts to appraise policy-makers of the veritable necessity for sabbaticals and continuing education for research (2).

Compounding the problem of nurturing a cadre of well trained researchers is the lack of scholarly resources to support investigations. Consequently, much of the research that is produced is duplicative and often restricted to use of the survey technique. Researchers seldom have direct linkages with current sources of bibliographic information. Further, while researchers in developed countries take for granted the immediate availability of research materials and online access to bibliographic information, such is not the situation in the Latin American and Caribbean region. Scholars in those countries must often look to foreign data bases and foreign journals even to discover works done in their own countries or fields. Even so, lengthy delays in between the identification and the provision of such materials are typical. Such a state of affairs is antipodal with the desire to be free of foreign influence (9).

Victor Rosenberg, an expert on information control in Brazil aptly observes that:

> Brazil and similar developing countries are caught in a squeeze. To have an adequate information processing capability, the country must rely on computer resources of foreign countries or import more hardware, both options that drain valuable currency resources. The alternative is to build a national computer industry, but this also requires resources, especially highly skilled manpower resources that are beyond the capability of all but the most developed nations (9).

A particular example of the restriction of information

transfer is bibliographic information, such as that contained in online bibliographic databases. Access to such immediate research information is hampered by the surcharges on telecommunications costs. In Brazil, for instance when $200 - 400 per hour are added to the databases own connect time charge, users with no financial support for their research will in effect be denied access to timely information. Rosenberg attributes this "overtaxation" policy to the desire on the part of the government to encourage the development of domestic bibliographic utilities for at least the most widely used databases - for example by leasing tapes from the originators and establishing a national service. Thus tapes would be searched online but only in one location and within the country. (9) This system, however, does not solve the problem of timely access to information. Requests are submitted by mail and the system would be decentralized so that different research information would be available from different agencies in different locations. While the research information is available nationally, the researcher is removed from the process and the possibility of serendipitously finding information is curtailed.

Even should such a national system be operational, it may not be as comprehensive as the library collections or databases in developed countries. It is not unusual for a Latin America researcher to pay a foreign source for information generated in his or her own country.

The third critical area in research is the appropriate analysis of information. A Latin American student of the production of library research in the region identified the following "negative characterics":

1. a plethora of plagerism
2. unnecessary duplication of publication of the same papers without modification in several journals
3. lack of standard terminology
4. lack of new ideas
5. inadequate bibliographic citations
6. failure to relate analysis to similar research in the field
7. extensive reliance on foreign works, especially those from the US and Europe coupled with lack of reference to national studies (1)

Efforts should be made within the profession to address these problems and to stimulate a critical spirit of investigation. The author believes that the following "positive characteristics" should exist:

1. professional responsibility, including honesty, commitment to the profession and to society in general
2. a control mechanism such as the development of an invisible college and peer review for journals
3. elaboration and application of strict qualitative standards for publication.

Clearly at the present time, the library/information science profession in the region is organized and sufficiently established to police itself. One of the underpinings of such a system is, of course, the ability to do better research.

Thus, to improve the quality of the research in Latin America, one must first enhance the capability of the people doing research. It is essential that provision for continuing education of current researchers be provided for at conferences and within their own schools. National associations and institutions related to the profession, as well as international organizations, need to exert influence at a high level of decision-making to improve incentives for producing significant contributions to the research literature.

Further professionals in the field must seek out relationships with other disciplines, thus improving cross-fertilization of ideas and the possibility of adapting techniques from other field to the problems facing the information professions today. It is imperative that more quantative analysis be used to support research findings, as is done in many other fields.

The gap between developing and developed areas in the production of information is enormous and self-generating. Few technical books and articles are published in quantity in Latin America. Consequently, many foreign works are used and those that are published nationally tend to rapidly go out of print. Publishers of professional literature must furthermore develop better mechanisms for peer review in the hopes of publishing excellent rather than mediocre papers. Scholarly communciations channels include journals as well as conference proceedings. Often these are available irregularly and the time lag is great between

production and availability of information (8).

Further, scholars in developing countries rely on an invisible college or network of researchers. Communications is often via telephone or face-to-face at conferences or seminars. Telephone communciations is often difficult in Latin America and provision of travel monies for scholars is not widespread. Although international agencies frequently invite participants from developing countries, clearly this is not the norm for most scholars in the region. The invisible college is nurtured through contact at seminars, conference, mail and telephone and through the timely publication of scholarly literature. The Latin American scholar is hampered by the lack of these and often finds out about someone doing research in his or her field of interest through foreign publications or with lengthy delay by queries in international data bases.

In an attempt to begin to resolve some of the difficulties of research in Latin America and the Caribbean, the International Development and Research Council of Canada (IDRC) funded as part of the IFLA's meeting in Montreal in 1982, a preconference entitled "Education for Research and Research for Education". This conference was the end result of a series of seminars and meetings that began in 1980 at the American Association of Library School's seminar on "Library and Information Science Education for the Americas" (Austin: February, 1980).

This seminar brought together 30 representatives from North and South America to discuss ideas and issues in library education. A seminal issues was the state of Latin American library research and the need to improve it. Clearly a one day seminar was insufficient to address the myriad problems of research and education. One of the principle recommendations was that an invisible college be nurtured in the region and that a forum be provided for the exchange of research information. Furthermore, the apparent need for the identification of researchers and research topics and well as research priorities on a national basis was enunciated. As a result of the Austin meeting a committee of North and South Americans was created to facilitate the achivement of the objectives outlined above and to identify potential linkages with other international organizations.

Members of the AALS steering committee also served on committees of IFLA, FID and ACURIL, thus enhancing the communications capability with appropriate organizations. A key member of the initial committee was William Cameron, Dean of the School of Library and Information Science, Western Ontario, Canada, who with Octavio Rojas, coordinating information from Latin America, created a directory of researchers in the region and their topics of investigation. The preliminary directory was reviewed at the IFLA preconference in Montreal and a revised edition will shortly be available. This is a first of its kind for the region and clearly in

an area where research is often difficult to identify and where too little is know about what research is being done and by whom, this directory is a major contribution to scholarship and begins to address some of the problems that identified in this paper.

Further action and coordination of research and training of researchers is a priority for the region and it is hope that the IFLA regional office in Latin America and the Caribbean (located in Bogotà) and the Theory and Research Committee of the IFLA together with other agencies should endeavor to improve the status and quality of research in Latin America with a variety of projects and with collegial support.

12 (12)

BIBLIOGRAPHY

1. Arboleda-Sepùveda, "Responsabilidad Profesional en la Producción de la Literature Bibliotecológia" Revista AIBDA v. 2 no.1, 1981. pp. 49-52.

2. Encuentro Latino Americano de Directores de Escuelas de Bibliotecología y Documentación, Bogotá, Noviembre 22-26, 1976. Informe Final. (Bogotá: Instituto Colombiana para el Formento de la Educación Superior, 1977).

3. Juarroz, Roberto. "Problemas actuales de la formación de Bibliotecários en America Latina" quoted in "Basic and Continuing Preparation of Teachers of Library and Information Science in Latin America" by Nice Menezes Figueiredo.

4. Licea de Arenas, Judith. La Educación Bibiotecológica en México: Consideraciones sobre algunos de sus Problemas, " Jornadas Mexicanas de Biblioteconomía 9 Merida, 1978.

5. Menezes de Figueiredo, Nice, "Basic and Continuing Preparation of Teachers of Library and Information Science in Latin America" in Library and Information Science Education in the Americas: Present and Future, ed. by William Vernon Jackson (State College, PA: Association of American Library Schools, 1981) pp. 39 - 58.

6. _____, O ensino da Biblioteconomía no Brasil: Relatório de Equipe de Pesquisa sobre O Status quo das Escolas de Biblioteconomía e Documentacão, com Enfase na Situação do Pessoal Docente (Brasília: CAPES, 1978) 3 vols.

7. Parker, J. S., "Library Resource Sharing in Developing Countries: Objectives and Obstacles" in Resource Sharing of Libraries in Developing Countries. IFLA Publications 14, ed by. H.D.L. Vervliet (Munchen: K G Saur, 1979) pp. 13 - 21.

8. Paz de Erickson, Ana María, "La Literature sobre Bibliotecología y la Ciencia de la Informacíon" in Revista AIBDA v.1, no. 2, 1980, pp. 147 - 153.

9. Rosenberg, Victor, "Information Policies of Developing Countries: the Case of Brazil" in Journal of the American Society for Information Science (July 1982), pp. 203 - 207.

10. Tell, Björn, Sobre Sistemas y Redes de Información en Venezuela (Lund: Universitetbibliothet, 1978).

11. Unamboowe, Ira, "A Unified Information System for Appropriate Technology" in UJISLAA v. II, no. 2, 1980 pp. 117 - 122.

12. UNESCO. Current Status of Regional Co-operation in Information Policy and Planning in Latin America and the Caribbean and Prospects for its Development. First UNISIT Meeting, Lima Peru, October 1-5, 1979. (PGI-79/CONF.606/COL.8) 23p.

IFLA
1983

IFLA General Conference Munich 1983
Division: Education and research
Section: Theory and Research
Working group on problems raised by the exhibition of library documents

165 - THEOR - 4 - E

Guide-lines for the lending of library documents: loan forms and various regulations concerning exhibitions

M.T. Varlamoff

For internal use only:
to be brought to meeting no:
.....139 a.....
Remarks:
to be presented orally ☐
for distribution only ☒

IFLA Conference

Munich, 1983

Division : Education and research
Section : Theory and Research
Working group on problems raised by the exhibition of library documents.

M.T.VARLAMOFF : Guide-lines for the lending of library documents : loan forms and various regulations concerning exhibitions.

An analysis of the documents (loan-forms, rules, environment and security questionnaires) used by libraries from different countries when they lend or borrow items for exhibition purposes. An attempt to classify the answers in order to determine which points are essential and which are less important.

Last year in Montreal a working group on problems raised by the exhibition of library documents was created. Mr. Kaegbein was kind enough to accept to be the president and asked me to be the secretary.

Our first aim was to collect from our colleagues loan-forms and rules concerning the lending of library documents to exhibitions. A letter was sent in February 83 to different countries to inform our colleagues of

- the creation of the working group
- the meeting which was to take place in Munich

and to ask the librarians to send us the loan-forms they used and the rules they followed. You'll find in annex the list of the countries and libraries that were contacted.

Out of 44 requests we received about 28 answers - which seems to be a happy number - and we also collected the loan-forms and rules from 9 additional institutions, which gives 37

answers to be analysed.

Variety of answers :

Out of the 53 institutions concerned by our survey,
- 16 libraries did not answer
- 3 libraries have no loan-form nor rules
- 4 libraries use inter-library loan request forms for books
- 4 libraries have sent a letter of comments
- 7 libraries have sent their loan-form
- 8 libraries have sent their rules
- 8 libraries have sent both loan-forms and rules

I. ANALYSIS OF THE ANSWERS.

Out of the 23 libraries which sent loan-forms or rules, 8 sent both. First we tried to analyse the loan-forms which are very different from one library to another. Some elements appear everywhere, others are specific. Loan forms are sometimes different whether they are issued by the lending or by the borrowing institution. Some serve as contracts, others are genuine questionnaires to be filled in before any loan can be asked for (Library of Congress, British Library, Victoria and Albert Museum of London). There are two levels concerning the rules : administrative and technical. They sometimes give recommendations and warning concerning the setting up of exhibitions (National Library of Caracas, Venezuela).

Loan-forms :

Those loan-forms are sometimes very detailed, sometimes very short, which does not automatically prove carelessness. For we have noticed that the more precise the loan-form is, the less precise the rules are and that, in some cases, there are no rules at all. On the contrary, when a library has edicted complete and precise rules to be signed by the borrower, its loan-form is relatively short.

We have classified the information collected on loan-forms in 3 groups, according to their recurrence.

Group I : More frequent information asked for.

They represent the minimal information necessary to start a transaction but we may fear that, listing so little information, those forms will demand further correspondence. In this first group we find information about the names of lender or borrower, title and dates of exhibition, identification and more or less precise description of the work, insurance value and shipping conditions - this information we consider too concise and even scanty.

Group II : Information less frequently asked for.

Among those information some are only administrative, others practical and we were surprised to see them quoted so seldom. Among those : the size of the work - with or without frame - As for the weight it is only asked for twice, which is surprising when one knows the problems faced by a courier who has something too heavy to carry by hand. Among other important points that are not always asked for : the exact form in which the lender's name should appear in the catalog and the authorization to make photographic reproduction.

Group III : Occasional information.

Among this type of information there is great diversity. Some are purely administrative (various addresses, names of different sponsors, persons in charge of the exhibition, library statute), others deal with the length of the exhibition or the material conditions under which works are exhibited.

One institution (Réunion des Musées Nationaux, Paris) even asks for complementary information about the work itself (state of preservation, defects, origin, previous exhibitions...). We also find various authorizations concerning reproduction (slides, post-cards, educational material).

In this last group we clearly notice that questions vary according to the type of institution, to its notoriety, to the importance of its loans, to the success and frequency of its own exhibitions.

The rules :

A main aspect of these rules is that they are very different according to the specificity and purposes of the library that set them up. We must notice that numerous points that we have already noted in the loan-forms are to be found again in the rules, the loan -forms and the rules being, as we already pointed it out, complementary. Something underlined in the loan-form won't necessarily be found again in the rules and vice versa. We have also divided the rules in three groups.

Group I : Points in the rules common to most institutions.

Most institutions want to know what they are asked to lend a long time ahead in order to have the possibility to discuss the opportunity of the loan with all the persons responsible. Regular meetings take place every 2,3 or 4 month and most institutions demand a 3 to 6 months delay.

Another important point : insurance, nail to nail, whose evidence should be given before the lending, shipping and especially the possibility of having the items escorted, expenses that should be eventually covered by the borrower and percentage of relative humidity (around 40% to 55%).

The other points concern security arrangements in order to avoid further discussion and recommendations (if not requirements) concerning the conditions of exhibition and conservation of the works in the show room.

Group II : Points in the rules less often quoted.

In this group we mostly find restrictive measures and recommendations on the conditions of exhibition and conservation. Let us also notice that some libraries demand to be insured by their own company when they lend an item.

Group III : Points in the rules occasionally quoted.

It is in this group that we can notice well what are the particular demands of each library. Some of them insist especially on the conditions of exhibition and security, others on the shipping conditions ; only one calls the borrowers' attention on the copyrights they might have to pay. The National Library of Caracas insists particularly on this tricky period during which the exhibition is being settled and offers advice in order to avoid the deterioration of the works. This example is unique

but should be followed in a more general way because it is not always during the transport or the exhibition itself that damages occur but during the handling of the objects while setting up or dismantling the exhibition.

Environment and security questionnaires :

Three institutions sent us the questionnaires they forward to the borrowers before they grant the loan. They are very precise questionnaires (first the one of the Library of Congress) on the material conditions in which the works will be unpacked, on the setting up of the exhibition and about the exhibition itself (security, actual display of items, environmental controls...).

This type of questionnaire is not redundant and could be used each time a loan is asked. It would allow the lender to lend without any risk or at least with full knowledge of the conditions.

II. CONCLUSIONS OF THE SURVEY.

We have tried to make an analysis of the documents concerning loans. It was difficult and even exacting (and here I want to thank Pascal Sanz from the Direction du Livre for his help) because, of course, the answers were not homogeneous and showed discrepancies in quantity as well as in quality. We also had some linguistic problems. I hope you'll overlook the mistakes which may occur in the results in the annex.

Out of this long work we can draw conclusions about

- the type of documents commonly used
- the lenders' concerns
- and what we have unfortunately to call the "carelessness" of some of them

and we shall try to have a discussion so that we can find out what could be

- the best way to harmonize the forms (presentation, contents)
- the essential points not to be forgotten in the rules specific to each library

- the possibility to enter in a same document the loan-form and the loan contract
- the regular use of an environment and security questionnaire before any loan is granted

The types of documents :

Sometimes it is difficult to distinguish among loan-forms those intended for borrowers from those intended for lenders.

Loan-forms intended for the lender insist more particularly on the conditions of the exhibition, the name of the persons responsible and give a list of the objects to be borrowed. But sometimes it occurs that this loan-form is more complete and allows the borrower to begin the writing of the catalog : it contains questions about the object itself and its historical background. Those loan-forms may also consist of authorizations for further photographic, T.V. or film production.

Loan-forms intended for the borrower often take the appearance of a contract whose purpose is to involve the responsibility of the borrower on certain points. In those forms we mostly find the conditions of packing, shipping and handling, the way the objects should be exhibited. Those forms could be easily replace by rules which the borrower would promise to obey in every detail. On the other hand this loan-form may show very useful if sent before the loan is granted. It gives the lending library the opportunity to think it over, to refuse to lend or to demand special arrangements more in accordance with the conservation and security rules of the institution.

The rules. They either represent only a few lines on the back of the loan-form or they are very detailed but they always aim at defining the loan to exhibition policy of the lending library. Some of them even serve as an internal regulation like those of the New York Public Library which warns its staff against the excessive loan of special documents.

We must notice that, whatever their importance, those rules almost always concern the same points :

- various protections against fire, water, theft, light
- precautions during transport, storage of the incoming documents, setting up and dismantling of the exhibition
- insurance
- authorization to reproduce
- name of lender to be mentionned in the catalog and number of catalogs to be sent to the lender
- inventory and examination of the objects after each transport
- eventually financial consequences of the loan
- sanctions incurred and possibility for the lender to take back the documents at any moment in case rules are not respected.

The lenders'concerns :

They are not constant and are different according to the countries, the dimensions and specificity of the libraries, the type of exhibitions they organize, the number and contents of the loans they grant.

What we have noticed is obvious :

- In Venezuela, an equatorial country, they care not only about temperature and relative humidity but also about protection against insects and fungi.
- Great national libraries have very administrative concerns and much worry about conservation and display problems.
- As for museums they seem to be more particularly interested in the works themselves, their characteristics and in their photographic reproduction.

Generally speaking the great libraries which lend or borrow a lot and for which exhibitions are a whole time activity have detailed loan-forms and strict rules.

Smaller libraries that organize few exhibitions seem to consider the loan of documents to exhibitions as part of inter-library loan for books and often neglect the practical aspects of conservation. Others tend to solve their problems each time differently according to the credibility of the borrower.

The carelessness of some librarians :

Numerous are the rules that remain indefinite. They talk about temperature and relative humidity, lighting, security without specifying where the average is. No doubt that most of us trust our colleagues and consider that we all know the conservation standards. This may be a mistake and it has proved very useful to remind all of us, whenever possible, of the main rules in use nowadays.

Besides, the shipping problem seems seldom considered. If, in most cases, an escort is considered as necessary, the shipping and packing conditions are not mentioned, even when it concerns countries with different climatic conditions.

Something often forgotten is the lack of information concerning the person in charge of the exhibition - to whom letters must be addressed if necessary, who is legally responsible, who will receive the lended works... - It would be most useful to know all this and it would avoid many wanderings.

After this brief survey of the inventory of the information received let's discuss the best way to harmonize loan-forms and try to determine which essential points should appear in every loan rule.

Here are some of the problems we could discuss :

- Is standardization necessary ? If so
- Should we make a difference between loan-forms for lenders and for borrowers ?
- Should we keep loan-forms and rules or replace rules by another type of questionnaire (cf. Library of Congress) sent before the granting of any loan ?
- What must appear in the loan-form ?
- What must appear in the rules ?
- How should they be presented ?
- If either one of these documents should be signed, which one should it be ?
- Is it better to elaborate common loan-forms and write more specific rules for each intitution ?

IFLA 1983

IFLA GENERAL CONFERENCE MUNICH 1983

Division: Education and Research

Section: Library Theory and Research

32 - THEOR - 1 - E

Developing Theoretical Frameworks through the Use of Borrowed Models and Interdisciplinary Interprenetration

By

Margaret Anderson
Associate Professor
Faculty of Library and Information Science
University of Toronto
Canada

For internal use only:
to be brought to meeting no:
177

Remarks:
to be presented orally [x]
for distribution only [ ]

DEVELOPING THEORETICAL FRAMEWORKS THROUGH THE USE OF BORROWED MODELS AND INTERDISCIPLINARY INTERPENETRATION

It is now well understood that all of the social sciences, wishing to be considered as independent academic disciplines, have recognized the need to develop theoretical frameworks which will both advance the horizons of scientific knowledge within the disciplines, provide coherence, and add to the potential for explanatory and predictive power over observable phenomena. Such theoretical frameworks are necessary for the development of research of both varieties -- pure, theoretical research, and the applied research needed for problem solving. Library/information science are perhaps, the last among the social sciences to have realized the need for a sound theoretical base for the advancement of the discipline, but both practitioners and educators face increasing problems in organizing and retrieving materials through use of major advances in electronic technology which have made more materials available to more people in less time, if one can only find out what is available and where. Combined with new emphasis on freedom of information, even on the international scene, comes the problem of linguistic equality which raises additional communication problems for those handling information and materials transfer, and ensures that the traditional ad hoc procedures with no particular theoretical or philosophical base no longer suffice.

While information science is a far newer discipline than the library science to which it is related [I am arguing that they are directly related and that the relationship is so close that they cannot be considered separate disciplines for the purposes of this paper], and, because of its relative newness, might understandably be in the early stages of theory development, library science, as an academic activity dates, for the Anglo-American world, from the establishment of the first

university-based library school founded at Columbia by Melvil Dewey in 1887. Although the 19th century was a period when many social sciences were emerging from 'natural philosophy' to claim recognition as separate and respectable academic disciplines in their own right, library science did not, for some considerable time, consider such a step. In its instruction, the concentration was on practical matters, the teaching of 'techniques', and such 'highly professional'activities as learning to write the 'library hand'. This pattern continued well into the twentieth century, almost to the total exclusion of basic principles and theory. In the two reports prepared by C.C. Williamson in 1921 and 1923; the first was so damning that it was not published for fifty years, necessitating a softened revision published in 1923; library educators were condemned for over-emphasizing techniques and practical work, to the total neglect of everything else. Williamson's report did little, however, to convince library educators and librarians to do anything more about his recommendations than to close all the library-based training classes, and to concentrate education for librarians on university campuses. Although he had recommended that library science programs be fully integrated into the university milieu in the same fashion that other graduate, professional programs were, that part of his recommendation received little attention. Some of the discipline's failure to change the character of its approach can be attributed to the economic problems caused by the depression, and to World War II, both of which prevented development of better facilities, or even the attraction of teaching faculty with higher academic credentials. A review of curriculum developments in 1943 (E.J. Reece. Programs for Library Schools. Columbia University Press), indicated that there had been very little change in the content over the preceding fifty years.[1] Some new courses had been added, there had come to be recognition of a "core", and three levels of pro-

fessional degree existed -- the B.L.S. (the one most frequently used as the entrée to the profession), the M.L.S., which required an additional year of study, and the Ph.D.

Perhaps we can argue that the advent of information science or, as it is sometimes called,'documentation',with its rapid embrace of computer technology, computational linguistics and the use of electronic media to store, retrieve and transfer information and materials, was the stimulus which sparked some interest, particularly among educators, in the development of theory. Certainly the 1950's and 1960's brought to library and information science personnnel the feeling that they had a unique niche of their own in the universe of knowledge, and tentative efforts toward the development of theoretical models began. Increasingly now, at least in the English language literature, one finds repeated calls for the development of theoretical frameworks for specific areas of concern -- reference services; collection development, especially through use of bibliometric analysis; communication theory in reference query negotiation; and theories about the nature of language to be used in facilitating machine indexing and processing of documents.[2] With the growing realization of the need for developing theory, and the growing understanding of its importance in delineating the specific characteristics of individual disciplines at given points in time, it is reasonable that library/information science should profit from the experience of some of the other disciplines which also have only recently awakened to an acknowledgement of the need for possessing empirical theories. One such discipline is political science, where descriptive, empirical inquiry is very much a post-World War II phenomenon. Sufficient literature on the development of theory in this discipline is available to permit examination of the process in some detail. Such an examination will reveal that considerable borrowing of models and concepts occurred, sometimes with adaptation to the peculiar needs of political science, sometimes with direct absorption of the model or concept already in use in some other social science. Much early theory

in political science, according to David Easton,[3] was based on borrowing from the other social sciences, and in the process Easton noted another interesting phenomenon occurring -- as political scientists "reached out", scholars in the other social sciences began "reaching in". While there was an influx of theoretical models into political science, the concepts of that discipline had an impact on other social sciences as well. This led to a stronger inter-relationship developing among them, strengthening developments in the theoretical process both for political science and for the individual disciplines where the interpenetration occurred. An examination of the possibility of such a process developing in library/information in tandem with another discipline might focus on the relationship which Artandi[4] suggested should exist between those interested in machine indexing, and linguistics, especially with reference to studies in semantics, where theory is only very recently being considered necessary.

Development of theory in political science -- the use of borrowed models

Insofar as political science possessed a body of theory at all in the years prior to World War II, its tradition was that of moral philosophy.There was much emphasis on the history of institutions and analysis of the work of political thinkers of the past. In that respect it was quite similar to library science, which had also developed a tradition of semi-historical, semi-philosophical writing, which resulted in histories of various libraries, and biographies, (rarely analytical), of major figures who had run them. There is a second similarity between the two disciplines in this period -- each spent a good deal of time in fact-gathering, a process which Easton calls "the myth of methodology". Political scientists were often involved with a rigorous collection of data, to the extent that one may describe the pre-scientific discipline as hyperfactual in

character. Librarians may not have collected as much data, nor as wide a range of it, but the collection of statistics often simply for the sake of collecting them, has long been a pet activity of many of them. No attempt was made in either case to summarize what was collected and to suggest its relevance or significance to any further investigation. Data was an end in itself. It was enough to say how much had been done, without commenting on its significance. Political science, Easton tells us, had trouble generating much in the way of a general theory from within its own resources because of its long association with moral philosophy. It was therefore forced to go outside the confines which it saw as part of its own discipline to find theoretical models when it chose to develop frameworks for scientific inquiry. There were pressures of both time and necessity requiring such a move if it were to remain an autonomous discipline cutting a unique swath through the investigations of social life. Easton describes the early period of borrowing:

> Decision-making theories from the organization field, the structural-functional approach from anthropology and sociology, action theory from sociology, and systems analysis from the communication sciences have offered vast reservoirs of fairly well-developed concepts and even, to a more limited extent, of theorems that have seemed cogent to students of political science. [5]

To a certain extent the other social sciences not only allowed, but also assisted in the borrowing. Easton adds that: "social scientists outside the field of political science itself have felt impelled to invent new theoretical devices for conceptualizing politics as a whole . . . Sociologists, economists, and anthropologists, among others, have turned their skills to systematizing the study of political phenomena, at a high level of theoretical generality."[6] Easton feels that such borrowing of theoretical ideas does in fact shed some light on the process of theory formation per se, by demonstrating that;

"the theoretical imagination does not need to wait for spontaneous generation to occur within a discipline".[6] He enjoins us to remember that we ought also to keep in mind the source of the borrowed theory and an awareness of the strengths, limitations and weaknesses it possesses within its original discipline.

In recent years library science has itself moved to borrow ideas from such fields as management studies, especially with regard to labour relations; personnel management; and marketing: but the borrowing has mainly involved using, often with very little adaptation, techniques rather than theories. Such approaches as the use of conjoint analysis, a marketing tool; role playing from psychology; zero based budgeting; systems analysis, etc. are increasingly being employed. More recently still there has been some 'tentative' approach to theoretical borrowing with adaptations to fit perceived requirements in librarianship -- administrative decision-making, communication theory, and the educational theories concerning children and reading, and children and learning. Such borrowing has not yet led us very far along the road toward shaping a body of general theory of our own.

Borrowing, even with the practice of adapting what is borrowed to fit the borrowing discipline, not only facilitates more rapid development of theory, but also creates some new problems. First, these may be generated by the haste with which theoretical formulation is attempted. Stanley Hoffmann's description of a problem facing political science would, with some of the disciplines changed, refer equally well to a situation which may face library/information science.

> So many disciplines -- law and sociology, geography and cybernetics, history and demography -- impinge upon the study of international relations that priorities are indispensable; even if one considers political science as a science of synthesis rather than

> as an autonomous discipline, one must acknowledge that there is a basic difference between synthesis and juxtaposition, science and chaos. Each discipline tries to answer a different series of questions, and these questions and answers are not of the same kind: they differ in subject matter (man as a biological unit, or relations among men or goods, or geographical factors) and in aim, (description or explanation or philosophy). To achieve synthesis, there must be a common denominator, a currency unit into which one can change the currencies of all the other disciplines. [8]

Theory can not be developed too quickly, whether it is based on the indigenous resources of a given discipline, or stems from a combination of borrowing and adaptation. This is true for both empirical theory, oriented to the study of concrete phenomena, or philosophical theory, oriented to the realization of an ideal. Most of the social sciences move, or have moved, through the same sequence of stages: early attempts to define theories, sometimes resulting in the creation of partial theories or focussing on particular problems; a stage where various possible theories are proposed, sometimes preceding the formation of partial theory, and usually referred to as the 'pre-theoretical' stage; and, finally, a stage where we find fully developed theories, both empirical and philosophical, being tested, revised, and used to expand the knowledge of the universe which is the concern of the particular discipline. In the process of the development certain logical problems arise.

Empirical theory in particular often develops according to focus, as attempts are made to analyze and refine concepts which are used to explain relationships. This presents us with a problem if the conceptualization is not rigorous enough, because the basic concept may not be fully analyzed by those who use it. Hoffmann makes the point that one of the major theories in international relations, that developed by Hans Morgenthau (whose work is presented as being both

empirical and philosophical), suffersfrom multiple confusions,[9] not the least being that the basic concept in it, "power", is never fully distinguished from among its various forms. Improperly or inadequately defined concepts contribute very little to the proeparation of sound theory, whether one is attempting to create either the empirical or philosophical variety. Theory based on basic concepts faces two other problems as well. The basic concept may not be of much use if it is based on an unjustified generalization of an idea which has validity only for a limited historical period. Morgenthau's concept of "national interest" which Hoffmann gives as an example , has validity only in periods of stability in international relations, and further presupposes national regimes which have similar goals and foreign policies which are not subject to the pressures of national passions. Finally, the basic concept can be faulty if it is taken from another discipline which gives it precise meaning, and is put into a discipline which uses it more as an illustrative metaphor, or heuristic device, than for anything else. The concept of "equilibrium" borrowed from physics, has a far more certain meaning when it is applied to phenomena which are not measurable in an explicit, precise fashion, as is true of many of the elements of international relations. In library/information science we encounter a similar problem when we speak of "human communication", or communication systems, and often do not distinguish among, or make explicit, the aspects of human communication we mean -- have we meant the terms borrowed from Shannon and Weaver as they discussed electronic signalling; the term borrowed from psychology or semiotics; the term as it may be used in anthropology. That there are difficulties in analyzing precisely what the characterisitics of the concept are, and how it relates to the social pattern, is made very clear in Colin Cherry's work, On Human Communication (3rd. ed. Cambridge, Mass.: M.I.T. Press, 1978), but the analysis and definition are needed nonetheless.

Another of the logical problems theoreticians face is the issue of the relation between empirical theory and action. Research generated by such theory for the purposes of determining action requires both a thorough analysis of reality, and a specific choice of values. The latter are often not made as explicit as they need to be, particularly if they are the author's own, and he is hoping to influence government leaders to pursue as their goals the

achievement of his ideals. If the values are made explicit however, the orientation of the study may decline into "apologia" or propaganda, neither of which is necessary.

Finally, there is the problem of the relationship between empirical and philosophical theory. There is a feeling, sometimes even a belief, that modern, empirical theory replaces, "comprehension of the essential nature of things with perception of process and causal laws that allegedly determine man's behaviour; the result, according to these critics, is to depreciate the value of prudence and to emphasize a utilitarian approach to research; it encourages a msuhrooming of hypotheses that assume man's infinite malleability, a simplified view of power, and the abstraction of man from the polity".[10] The danger of a purely scientific, empirical framework totally cut off from the philosophical and aiming at total objectivity and neutrality is that it leads its proponents into imitating the physical sciences, and postulating a closed society, thinking that what "is" is what "must be". Moving in the other direction, however, and taking insufficient account of reality may lead one into the error of believing that what "ought to be" already exists. Hoffmann suggests a solution is to be found by permanent and reciprocal interplay between the two types of theory:

> General empirical theory provides first resort against the risk of arbitrariness, against the tendency to prophecy and political bias within empirical research itself: 'The road to objectivity passes through theory,'* through the rigorous and systematic examination of the whole, through the construction of a framework in which even very general hypotheses can be submitted to a critical test. Empirical theory has its own laws, which require that the biases be restrained and that taboos erected by society be ignored or destroyed. The point is to keep our prejudice from becoming obstacles to the search for truth, but this does not mean that the values we believe in should not serve as our guide. The usefulness of philosophical theory for the empirical theorist is precisely that it helps him to make explicit the preferences subsumed in the categories he uses and the relationships he stresses, to reveal to him the postulates about the nature of man, of society, of the state, or of the relations among states that are deeply rooted in him and that cannot but

* Raymond Aron. "Science et conscience de la société". European Journal of Sociology (1960)

> affect his work. A genuine understanding of philosophical theory will therefore operate as a methodological warning system. [11]

A comprehension of the validity of, and the need for such interplay between the two types of theoretical approach is as valid for those engaged in constructing theoretical frameworks for library/information science as for the other social sciences. Library/information science, in its past attempts at theoretical frameworks, has also tended to concentrate on the philosophical, as opposed to the empirical, but even its 'philosophical' has been more of a meandering 'glad tidings', as Ralph Beals used to describe it, than sound postulating about the nature of the profession, its practitioners, or its institutions.

In terms of formulating types of theory, library/information science and its educators can learn much from the advice which Hoffmann, Easton, and others of their generation supply. When developing theoretical frameworks and concepts there are certain principles we ought all to keep in mind. Initially the objective of theoretical research is understanding, not action. Pure theory precedes applied theory, although the questions which the theorist is asking himself as he struggles to develop his theory often come from current problems faced in the "real world". His conclusions will quite likely be, if they are correct, useful for indicating what future action ought to be taken. Hoffmann says: "theory tries to rise above events; action must take the events into account. From a given theory, multiple actions can be deduced; its main usefulness is negative -- it shows what cannot be done." To move from empirical theory to action requires the re-introduction of events and values.

Secondly, while the tendency may be toward theory development through what is thought to be the easiest path -- setting up limited theories, or partial theories which cover particular facets of the field or discipline, Hoffmann and Easton both warn against this. An arbitrary isolation of a single aspect of all the phenomena of library/information science may produce erroneous conclusions because of the neglect or distortion of the bonds linking this facet to the whole. It is also impossible to build up general theory by simply summing the total of more limited or partial theories. But if we have no general theory as base, no set of hypotheses covering all

the data, or even a set of validated laws --Hoffmann's solution is this:

> We ought, then, to begin with a more modest general theory -- a framework of concepts and questions dealing with all the phenomena andcapable of orienting research by placing partial sectors in the context of the whole. From this point, efforts to produce well-worked-out partial theories and efforts to refine the general theory by filling the framework with increasingly precise hypotheses could be made side by side. 12

Co-operative theory development -- library/information science and linguistics

We have previously noted Easton's comments that interpenetration among related disciplines has a positive effect in both directions. One discipline with high potential for making positive contributions to development of theory in information science is linguistics, especially that branch of linguistics concerned with the study of meaning in written language -- the emerging and now somewhat more rigorous methodologies of semantics.

Telecommunications and satellite technology now permit transmission of information on a world-wide basis, but this very creation of an electronic "global village", at the same time as the "North" is moving rapidly forward in the post-industrial revolution, produces monumental problems. Not only is information and data transmitted electronically , but bibliographic and textual data are being generated and stored in computer data bases, from which they must be retrieved for use. Highly sophisticated operations need to be performed on documents in order to store them in a manner which allows their retrieval in terms of the subject matter of their contents. Here then is one area where linguistics and library/information science overlap: both disciplines are involved with formal analysis of conceptual meaning, which carries the further implication that they ought to share common interests in developing a framework of semantic theory. Artandi asserts that such developments are essential to us:

> Since machine indexing, abstracting, and text searching all involve the extraction of meaning from text, the mechanization of these processes implies that the computer understands the meaning of the text. It is clear that the study of meaning should contribute greatly to research in automatic text processing. The vigorous and useful

> research activities of the 1960's have not tackled this problem, however, and research in automatic text processing in general, and machine indexing in particular, seems to have reached a plateau.
>
> Researchers generally agree that the empirical approaches are not sufficient and that considerable theoretical knowledge is needed before further progrss can be made. There is good reason to believe that part of this knowledge concerns the implications of some major linguistic and semiotic concepts for both human and machine indexing. [13]

Although Artandi's article appeared in 1976, the intervening period has not seen much interdisciplinary discussion between those linguists concerned with the development of theoretical frameworks for the study of meaning, and those concerned with similar problems in information science. A possible explanation for this lack of discussion will be offered below, when we examine another area in linguistics which ought to be developing an 'overlap', and also has not.

Returning to the argument that there ought to be closer connections between the disciplines of linguistics and library/information science we can observe that there are at least five areas of language analysis which linguistics can contribute to developments in library/information science.[14]

1. Naturalness -- documents stored bibliographically or in whole text format in computer systems are normally stored in natural language. [We will omit reference here to the numerical data bases, while acknowledging their existence and importance.] Requests for the information which the documents contain are also in natural language, and so such language ought to be the first means of communication with any documentation system. What is needed at this point is a method of reducing to some reasonably well disciplined form, the varieties of ways in which a given thing can be said in everyday language. An ad hoc, pragmatic approach which has to be changed for each different subject field or individual discipline, might be unnecessary if one could develop a theoretical organization scheme for conceptual language.
2. Ambiguity -- viewed in isolation sentences can be ambiguous in meaning and individual words often are too, since they may well have several unrelated meanings. "Linguists have shown that the formal processes of syntactic analysis can do much to reduce ambiguity, and progress that has been made on comparable semantic processes can be expected to continue." [15]

3. Precision -- both descriptions of, and requests for, documents, take the form of unordered lists of terms, and even if these come from agreed-upon lists, the 'unordering' leads to fundamental imprecision which can seriously affect the result. If some kind of syntax is defined over a set of terms, ordering improves the precision count. If the system is sensitive to syntax one stands a far better chance of getting only what one wants. If, for example, one wants a recipe for 'sole bonne femme' (poached fish with egg sauce), and the system is not developed sufficiently to provide a syntactic order for the individual terms required, one may well get a recipe for poached eggs with fish sauce [should such a recipe exist] in addition to, or in place of, what one really wants.
4. Semantic structure -- to deal with the problems raised by synonymy and ambiguity of individual terms on the one hand, and whole sentences on the other, one might establish a set of 'semantic primitives', or one might appeal to structural semantics. In information science it is traditionally the first approach which has been adopted; we have set up thesauri, authority lists and so on, to handle indexing and analysis of documents. Although much linguistic sophistication is necessary to develop a workable semantic structure on which to base an information system, joint efforts between researchers in the two disciplines ought to be encouraged.
5. Decoupling -- most especially in the early stages of work on an information system it is highly desirable to separate as far as possible the language that must be used to communicate with the system from both the data store, and the logical operations which are needed to manipulate it. Such procedure is necessary in part because one may need to use different languages at different times, and individual languages continue to change and develop. In semantics as it is currently working, one of the new approaches to the development of theory is the use of language to analyze language -- an operation which requires such "decoupling"as is described above.

Theoretical frameworks in the social sciences, that area of the academic disciplines to which library/information science belongs, must be empirical, rigorous, and scientific. Because of its long involvement with

philosophy, semantics has only reached the stage described by Geoffrey Leech as that of a "would-be science".[16] It is moving forward steadily toward the rigorous and empirical, and this, he adds is important, for:

> to have reached the stage of advancing towards the goals which ensure an increasing approximation to the truth is not to be despised. This is the ideal toward which any sphere of knowledge progresses -- not because there is a snob value, or guarantee of respectability, in being able to call one's studies 'scientific', but because the pursuit of goals of empirical investigation is a mark of one's seriousness in wanting to find out the truth.[17]

Traditionally both the study of semantics and library science have claimed their roots to be set in the humanities disciplines, rather than among the social sciences, but both are moving toward more rigorous methodologies for research purposes. Both library/information science and semantics now claim many adherents who are asking the questions which are the necessary pre-requisites to the establishment of theory. In discussing the position of semantics in this respect Leech points out:

> An autonomous discipline begins, not with answers, but with questions. We might say that the whole point of setting up a theory of semantics is to provide a 'definition' of meaning -- that is, a systematic account of the nature of meaning. To demand a definition of meaning before we started discussing the subject would be to insist on treating certain other concepts, e.g. stimulus and response, as in some sense more basic and more important. A physicist does not have to define notions like 'time', 'heat', 'colour', 'atom' before he starts investigating their properties. Rather, definitions, is they are needed, emerge from the study itself.[18]

The 1960's showed us some rather interesting attempts to make semantics more systematic in terms of linguistic description, and these approaches began in the field of computational linguistics. The work was done in two related areas -- attempts were made to develop a semantic theory which would permit machine handling of texts and reduce the ambiguity caused by words with several meanings as well as allowing for the handling of synonyms, and there were also serious efforts launched to develop methods for machine translation.

The most frequently cited paper describing the initial steps toward the development of semantic theory in this field of linguistics appeared in 1963. It was written by J.J. Katz and J.A. Fodor, and entitled, "The Structure of a Semantic Theory".[19] Howard Maclay describes the immediate impact of this paper:

> This move provides the impetus for a number of significant changes in syntax as semantic requirements were imposed on the syntactic component. Initially, Katz and Fodor argued that linguistic knowledge could be separated from the rest of a speaker's knowledge about the world, and that the syntactic machinery of GT-1 [General Theory - 1] could provide a basis for a semantic interpretation consisting of one or more readings to each sentence. . . [20]

He goes on to say a bit later:

> This attempt to present a principled basis for the definition of linguistic meaning is obviously crucial to the incorporation of semantics into grammar. It represents a cautious expansion of the domain of linguistic theories which regards and treats semantics as a completely secondary and subservient component of grammars. In operation, the semantic component takes as input a structural description of some sentence (S). It has available a dictionary entry for each word in S which states not only the syntactic classification of the word, but also provides by the use of semantic markers, distinguishers and selection restrictions, the information necessary for the operation of the projection rules which combine the meanings of individual words into the meanings possible for the whole sentence. [21]

Uriel Weinreich, while acknowledging the immediate importance of the work of Katz and Fodor, noting that it was quickly incorporated into a theory of linguistic descriptions, and also became an impetus for major revisions in transformational syntactic theory,[22] also noted that their proposals were, in a number of ways, quite unsatisfactory. Whether more co-operation with information retrieval experts would nave been useful at that point in time is, from hindsight, hard to say. The goal of a semantic theory, according to Katz and Fodor, was intended to account for certain aspects of human competence vis-a-vis a language. This competence involved the production and comprehension of expressions taken out of a non-verbal setting in which they happened. They were further, concerned to draw a line between grammatical and semantic markers in terms of the theoretical function they performed, and in the end, Weinreich says, their argument

turned circular:

> This conclusion only begs the question; as we have seen the distinction between grammatical and semantic anomalies is still unexplained. Instead of being dispelled, the confusion that 'has been generated in the study of language by the search for a line between grammar and semantics' is only increased by the disguised circularity of the KF argument. [22a]

Another critic who sharply castigated the framework proposed by Katz and Fodor was Manfred Bierwisch,[23] who wrote several papers in the late 1960's dealing with approaches to classifying semantic features. The Katz and Fodor paper, for all its faults, was an initial attempt at devising a theoretical semantic framework, and it appeared shortly after the publication of Yehoshua Bar-Hillel's 1962 paper in the Times Literary Supplement, under the title; "The Future of Machine Translation".[24] He put forward the view that machine translation of languages was both theoretically and practically impossible. Autonomous mechanical translation, (or, for that matter, 'autonomous mechanical indexing'), could not approach the standards reached by qualified human translators, (or indexers), even if the materials being handled were restricted to scientific or technological items, rigorously formatted.

> This "pessimistic" evaluation is based upon various considerations, only one of which will be presented here, and even this, for obvious reasons , only very shortly and therefore dogmatically. Expert human translators use their background knowledge, mostly subconsciously, in order to resolve syntactical and semantical ambiguities which machines will either have to leave unresolved or resolve by some "mechanical" rule which will every so often result in a wrong translation. . . there are innumerable semantical ambiguities which nothing but plain, factual knowledge or consdierations of truthfulness and consistency will resolve, all of which are beyond the reach of computers. [25]

Automatic machine handling of natural language texts, whether for translation purposes, or indexing and abstracting, is of considerable interest to both librarians and information scientists coping with increasing floods of publication in nearly all the world's languages, especially when they are trying to delineate the major topics being written about in languages which they or their clients may not know well,or at all.

Yorick Wilks, writing in 1978 for a London seminar on computerised translation,[26] mentions some of the more notable efforts to devise semantic frameworks for machine translation which appeared after the early 1960's.

> Machine translation has traditionally been much preoccupied with the problem of finding the topic in a text: in the "Time flies like an arrow." example, we would have the correct reading if we could find out, from wider context, that the sentence is about time, and not about flies or liking. The semantic system of Charniak tried to detect topic by specific cues, while the Schank and Wilks systems did so by general rules ranging over semantic representations expressed in primitives. In the Winograd system on the other hand, topic can never be a problem because it always blocks world! [27]

A second paper presented at the same seminar stressed the need for a "high-level" (one hopes 'theoretical' is the term intended), scrutiny of the relations between translator and machine, particularly in the light of the advances made possible by the new telecommunications equipment, and the development of the concept of "linguistic equality". Margaret Masterman spoke specifically of translators and translation, but her words surely carry serious implication for the librarian/information scientist actively involved with the document transmission (and/or collection) which would be required to meet the needs of the European Commission she describes:

> In particular, the European Commission is confronted with an escalating problem; and that for an exceedingly honourable reason. For, whereas the historical solution for the "problem of Babel" was for there to be, on a naked imperialist basis, one "language of dominance" belonging to the nation which had conquered the other nations in the course of founding its empire -- with all the other languages, belonging to the nations which had been conquered, "languages of servitude" -- the European Commission, by its articles, has created the new conception of "Linguistic equality". Every language of a member nation, within the Commission, is to be regarded as the equal of every other; and every important Commission document is to be issued in every Commission language with no one statement of it being regarded as a translation of any other. [28]

In urging that translators not only come to terms with the "machine" but go on in fact to become friends with it, she touches on two points which are of fundamental interest to information specialists:

improvement of the translating, especially in terms of speed; and, using the machine to investigate "deep structure", the point needed to get at the essence of the printed document.

> In the end, even when it comes to the improvement of human translating, a period of interaction with a machine may become something which a translator, in these technological days, very much needs. And the machine itself may then end up as the "translator's best friend".
>
> For machine translation is not a piece of black magic; neither is it a "black box" embodying a fraud, calculated to deceive (or, more likely, to affront) the public. It is a bi-lingual extension of word-processing: but because it is contrastive, as between languages, we can use the high-level new skills which its realistic development requires that translators should acquire, to discover -- also contrastively -- what the "deep structure" of the translation-relation really is: and that is something which has remained wholly unknown, up to now. 29

We noted earlier that there was, and still is, relatively little communication between information specialists and those working on analysis of meaning and translation problems in linguistics. This can be substantiated in the English language literature of information science when one notes that several linguists do get cited there (among them John Lyons, Katz, Fodor, Bar-Hillel, etc.), but the information specialists working on problems of analyzing meaning for their particular purposes, are rarely, if ever, cited by the linguists. This may, in part be due to a perception of information specialists which is similar to the perception often held of librarians -- they are not scholars, they are chiefly storekeepers. The mis-understanding of the nature of the level of skills needed for work in given disciplines is not, of course, confined to a failure to comprehend what library/information science is, however. We noted earlier that, even as we have attempted to define some of our terms for concepts instead of asking the questions that might lead to definition, so too, had those involved with smeantics based in philosophy. And the developments of machine [aided] translation and the linguistic problems stemming from the concept of "linguistic equality" have served to highlight another set of misperceptions which are equally unfortunate. Masterman makes this

observation:

> The current difficulty however, is that the nature of these skills [needed to help the translator to be truly aided by the machine] is not yet understood. The reason for this lack of comprehension is two-fold. The academic world, on the one hand, has not yet conceded that machine translation is emerging as a specialist discipline in its own right: for academics, "M.T." is still a, probably disreputable, off-shoot of linguistics: (the more so as this downgrading covers up the fact that linguistics, predominantly, examines only a limited corpus of unilingual material, and therefore lacks any adequate technique for examining the interrelations between two or more whole languages). The data-processing world, on the other hand, sees machine translation as just a special sort of data-processing: the fact that two whole natural languages, (at least), are involved in it, and in what, for data-processors, is a new and unique way -- all this passes the systems analysts by.
>
> The result of this double failure, within the existing specialties, to grasp the unique nature of the problem, has caused a bi-furcation of the two interests involved, with machine translation falling down the gap between the two. It is not going to be until the human translator makes himself felt, not only as user, but also as designer and manual-writer, that further progress in obtaining a genuine man-machine translation interaction is going to be made. And therefore the translator must insist, forthwith, on coming into this new discipline, on an equality with the programmer, and in a dual capacity, actively as well as passively: and to this end, on being provided with the detailed knowhow which he requires. 30

Development of theories and theoretical frameworks through 'interpenetration' and co-operation can only be achieved if those active in both disciplines make themselves "felt", and if each group recognizes the legitimacy of the status of the other. Such recognition comes slowly, and not only when one makes one's self "felt", but also when one has something of value to offer to the other group, and can articulate it in a fashion which is recognizable by them.

Footnotes:

1. Shera, J.H. and M. Anderson. Education for Librarianship in the United States and Canada. Liverpool: Liverpool Polytechnic, Department of Library and Information Science, 1975. Occasional Paper No. 5. p.5 Reference is made here to the continuation of the "traditional" form of teaching instead of emphasizing "scientific" thinking, and two studies are described -- that of Keyes Metcalf (The Program of Instruction in Library Schools. Illinois Univ. 1943), and that of Joseph Wheeler for the Carnegie Corporation (Progress and Problems in Education for Librarianship, 1946.)-- both of which indicated that schools taught, for rote memorization, the basic 'how-to do-it' courses cramming detail into a program with no reference to any underlying philosophy of either the nature of the profession or the nature of the library as an institution.

2. One could certainly point out that one aspect of library/information science has had a long and respectable history of "theory". Theories of classification of knowledge, and of classification of recorded knowledge in libraries date from the 19th century in terms of modern thinking, thanks to the work of such men as Paul Otlet, Henry Bliss, W.B. Sayers and Ranganathan and his school. In the writing of Williamson and in some of the writings of Louis Round Wilson there was also explicit acknowledgement of the need for theoretical frameworks, and some indication of the areas for which these should be developed first. In the U.S.S.R after 1917 there was theoretical work of a somewhat different sort, as Kruspskaia interpreted V.I. Lenin's philosophy concerning the . function of the library in the political education of the populace.

3. Easton, David.ed. Varieties of Political Theory. Englewood Cliffs, N.J.: Prentice-Hall, 1966.

4. Artandi, Susan. "Machine Indexing: Linguistic and Semiotic Implications." JASIS 27 (1976) 235-239.

5. op cit. p.7

6. Ibid. p. 8

7. Ibid. p. 12

8. Hoffmann, Stanley. "Theory and International Relations." In: James N. Rosenau, ed. International Policy and Foreign Policy; a reader in research and theory. Rev. ed. New York: Free Press, 1969. pp. 30-40. p. 31.

9. Ibid. p. 32.

10. Ibid. p. 34

11. Ibid. p. 39

12. Ibid. p. 37

13. op. cit. pp. 235-36.

14. The following five points are summarized from: Sparck Jones, Karen, and Martin Kay. Linguistics and Information Science. New York: Academic Press, 1974. pp. 43-44.

15. Ibid. p.43

16. Leech, Geoffrey. Semantics. Harmondsworth: Middlesex: Penguin Books, 1974. p. 70.

17. Ibid. pp. 70-71

18. op. cit. p. 4.

19. Katz, J.J. and J.A. Fodor. "The structure of a semantic theory". Language Vol. 39 (1963) 170-210. Reprinted in: Fodor, J.A. & J.J. Katz, eds. The Structure of Language: Readins in the Philosphy of Language. Englewood Cliffs, N.J.: Prentice Hall, 1964.
For further elaboration see also: Katz, J.J. The Philosophy of Language New York: Harper & Row, 1966. and: Katz, J.J. Semantic Theory. New York: Harper & Row, 1972.

20. Maclay, Howard. "Overview". [to Part II: Linguistics] IN: Steinberg, Danny D. & Leon A. Jakobovits. Semantics: an interdisciplinary reader in philosophy, linguistics and psychology. London: Cambridge University Press, 1971. 157-182. p.169-70.

21. op. cit. p. 171

22. Weinreich, Uriel. "Explorations in Semantic Theory". IN: Steinberg, Danny D. & Leon A. Jakobovits. Semantics: an interdisciplinary reader, etc. pp. 308-328.

22a. op. cit. p. 316.

23. Bierwisch, Manfred. "On Classifying Semantic Features". IN: Steinberg & Jakobovits, eds. Semantics: etc. pp. 410-435.

24. Bar-Hillel, Yehoshua."The Future of Machine Translation". Times Literary Supplement (March-June, 1962) pp. 32-37. Text used here reprinted in: Bar-Hillel, Yehoshua. Language and Information: selected essays and their theory and application. Reading, Mass.: Addison-Wesley , 1964. pp. 180-184.

25. op. cit. p. 182.

26. Wilks, Yorick. "Machine Translation and Artifical Intelligence." IN: Snell, Barbara M. ed. Translating and the Computer: Proceedings of a Seminar, London, 14th November, 1978. Amsterdam: North-Holland Publishing Co., 1979. pp. 27-43.

27. op. cit. p. 31

28. Masterman, Margaret. "The Essential Skills to be Acquired for Machine Translation." IN: Snell, Barbara M. ed. Translating and the Computer. pp. 159-167. p. 159.

29. op. cit. p. 166.

30. Ibid. p. 159-160.